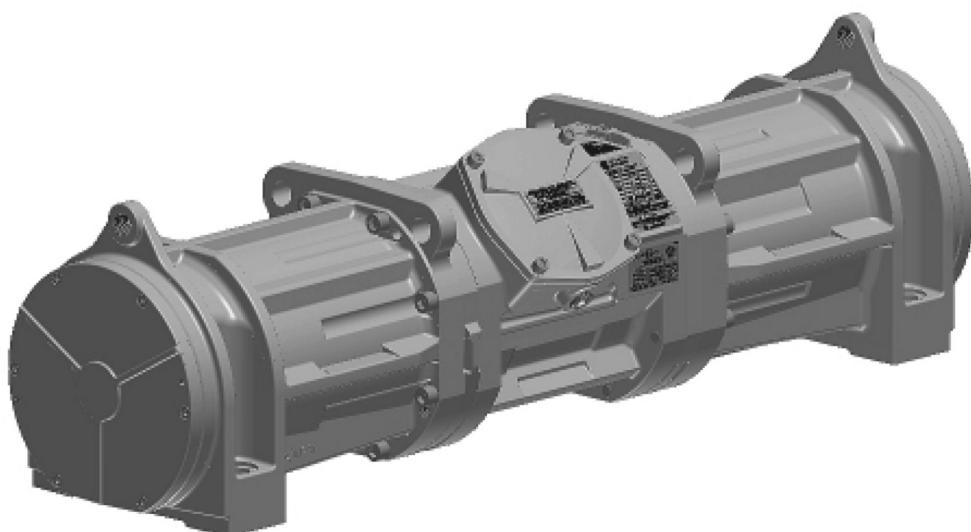


Italvibras USA

Industrial Electric Vibrators

For Use In Hazardous Locations



Model MVTX

Operator's Manual



Table of Contents

Section Title	Page
Tables and Figures Index	Below
Introduction	2
Installation Design Tips	3-10
Eccentric Weight Adjustment	11-12
Lubrication requirements	13
Electric Vibrator Repair & Maintenance	14
Appendix	
Electric Vibrator Item Numbers	A1
Electric Vibrator Torque Requirements	A1
Electric Vibrator Parts List Diagrams	A2-3

Figures

Figure #	Page
1 Mounting Bolt Torque Sequence	4
2 Nameplates	5
3 Wiring Diagrams	6
4 Proper Wiring Arrangement/Positioning	7
5 Terminal Block Hardware Installation	7
6 Wiring Block Assembly	8
7 Manual Reset Connections	9
8 Ground Bonding Screw	10
9 Removing the Weight Covers	11
10 Weight Fastener	11
11 Setting Sets of Eccentric Weights to Mirror Images	11
12 Eccentric Weight Adjust	12

Tables

Table	Page
I Mounting Bolt & Torque Requirements	4
II Lubrication Schedule for Each Bearing	13
III Vibrator Item Number By Frame	A1
IV Vibrator Nut & Screw Torque Requirements	A1

Introduction

Italvibras USA explosion-proof and dust-ignition-proof industrial electric vibrators have been designed and manufactured in accordance with the most exacting international industrial standards and requirements. Italvibras USA industrial electric vibrators are designed for long life at continuous duty and maximum force output. The electric vibrators are suitable for operation in ambient from -25°C to 40°C for Class I and Class II electric vibrators and for operation in ambient from -25°C to 55°C for Class I electric vibrators.

Italvibras USA industrial electric vibrators have been evaluated for installation throughout the world. Standard ratings include Underwriter's Laboratories, Inc. (UL) Listing, CSA (Canadian Standards Association) Approval, the CE (European Directive) Mark, EX Approval for Zone 1, 2, 21, 22 (ATEX II2GD, Ex d IIB T 120°C Gb, Ex t IIIC T120°C Db, IP66) and IECEEx Approval (Ex d IIB T120°C Gb, Ex t IIIC T120°C Db, IP66). Check the electric vibrator nameplate for the exact ratings and Approvals for the specific Model.

The electric vibrator can be referred to by its Model or Type designation or by its Item number. The vibrator Model or Type designations referred to in this manual are as follows:

MVTX - Continuous duty explosion-proof industrial three phase electric vibrator.

The Italvibras USA explosion-proof electric vibrator is intended for the following hazardous locations:

In areas that have explosive or flammable gases, vapors and/or dusts where the explosion hazard is referred to as Division 1 or Zone 1, the electric vibrator is marked for Class I, Groups C and D and Class II, Groups E, F and G hazardous locations and Ex d IIB T120°C Gb and Ex t IIIC T 120° Db.

In areas that have explosive or flammable gases and/or vapors where the explosion hazard is referred to as Division 1 or Zone 1, the electric vibrator is marked for Class I, Groups C and D hazardous locations and Ex d IIB T160°C Gb.

Italvibras USA MVTX explosion-proof electric vibrator complies with the Essential Health and Safety Requirements: EN 60079-0:2009, EN 60079-1:2007, EN 60079-31 :2009, IEC 60079-0:2007, IEC 60079-1:2007, IEC 60079-31 :2008.

General Safety requirements

Read this entire manual before proceeding. Compliance with all company, local and OSHA regulations is essential. Any electrical work must be done in accordance with all applicable local and national codes and must be performed only by qualified, licensed and authorized personnel. Always follow lockout and tag out procedures and requirements and always wear ear protection when in close proximity to operating vibratory equipment.

Comprehensive adherence to these documents at a minimum is required – The National Electrical Code NFPA 70, ANSI z244.1 the American National Standard for Personnel Protection – Lockout/Tag out of Energy Sources – Minimum Safety Requirements, CFR 29 Part 1910 – Control of Hazardous Energy Sources (Lockout/Tag out) Final Rule and CFR 29 Part 1910.15 Occupational Noise Exposure.

Dimensions of flame-proof joints are other than the relevant minimum or maximum specified in Table 2 of EN 60079-1:2007. Vibrators are marked with an "X" and manufacturer's Drawing Nos. 601531, 601534 and 601536 detail the dimensions of the flame-proof joints.

Storage

Storage of the electric vibrator should be in an ambient not less than 5°C with a relative humidity not more than 60%. If the vibrator has been stored for longer than two years, the vibrator should be evaluated by authorized and trained personnel to ensure that the grease is intact, that there is no bearing damage such as brinelling and that the ground insulation is sound and not damaged from condensation.

Installation

Before installing the vibrator, make sure that you have everything that you will need and that there is no shipping damage. Any product damage should be reported to the delivery service immediately. Standard metric hand tools will be needed. Carefully handle the electric vibrator. Dropping or impacting the electric vibrator may damage the bearings.

Welding – Never weld on a machine with the electric vibrator mounted to it since the welding may damage the vibrator bearings or electrical circuits. When you do weld, especially in an enclosed area, make sure that the area is known to be nonhazardous and that there are no flammable or explosive levels of gases, vapors or dusts.

Mounting Surface – The object of vibration is to transmit vibration energy through the structure to the material within. The mounting surface must be rigid and strong for this transfer of energy to take place. The mounting surface must also be clean, flat (0.010 in. across mounting feet maximum), free of paint and have a minimum thickness equal to the major diameter of the mounting bolt. The mounting plate should be at least the overall size of the electric vibrator feet. Also make sure that the electric vibrator feet are clean and free of debris.

Mounting Hardware & Torque

Always use new bolts, nuts and compression washers. The bolts should be Grade 5 or 8 (equivalent international designation is 8.8 and 12.9, respectively). Grade 5 bolts are suitable for a majority of applications. Do not use split lock washers. Use only compression washers. Table I offers suggested mounting bolt torque values. Always check with the bolt manufacturer for recommended torque values. Torque the mounting bolts in the proper sequence as shown in Figure 1 so as not to damage casting. After operating vibrator for 15 minutes, disconnect, lockout/tag out, and torque the mounting bolts a second time. Periodically check the mounting bolt torque thereafter.

Table I. Mounting Bolts & Torque Requirements

	British		Metric		
	Frame Size	Bolt Size	Dry Torque (ft-lb), Grade 5	Bolt Size	Dry Torque (kgm), Grade 8.8
MVTX	70	1 in-8 NC	645	M24	89
MVTX	80	7/8 in -9 NC	430	M22	56
MVTX	90	3/4 in -10 NC	288	M20	38

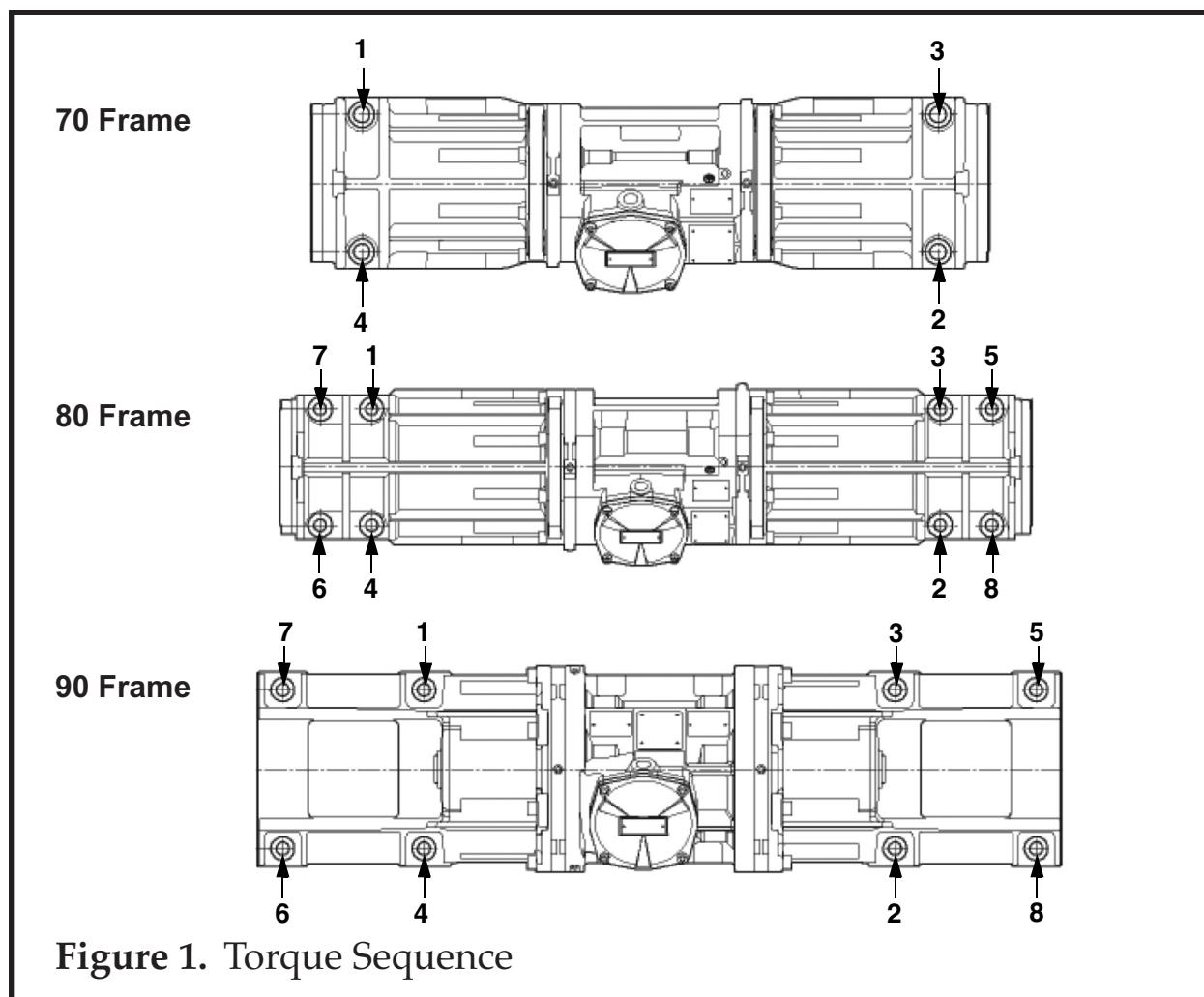
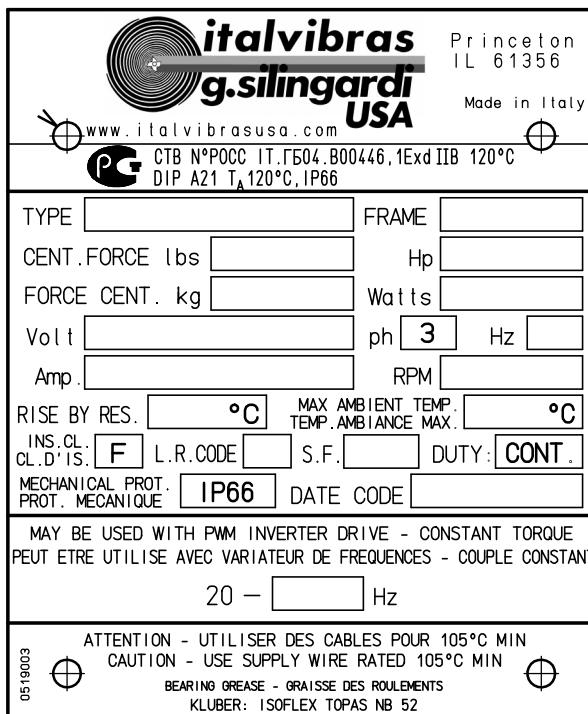


Figure 1. Torque Sequence

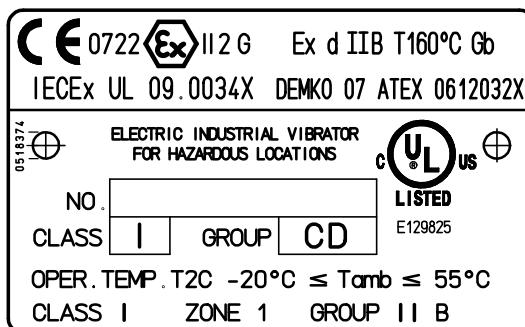
Vibrator Nameplates



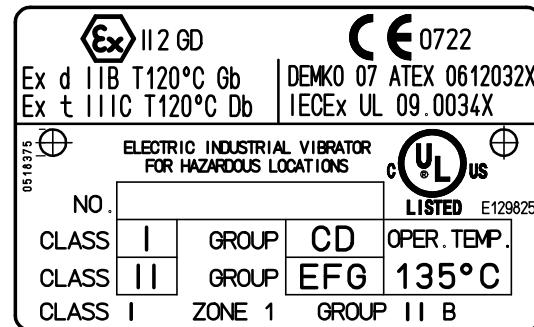
**Stainless Name Plate For
Explosion Proof Vibrators,
Item #519003**



**Stainless Warning Name Plate For
Explosion Proof Vibrators
Item #518497**



MVTX G - Stainless Name Plate

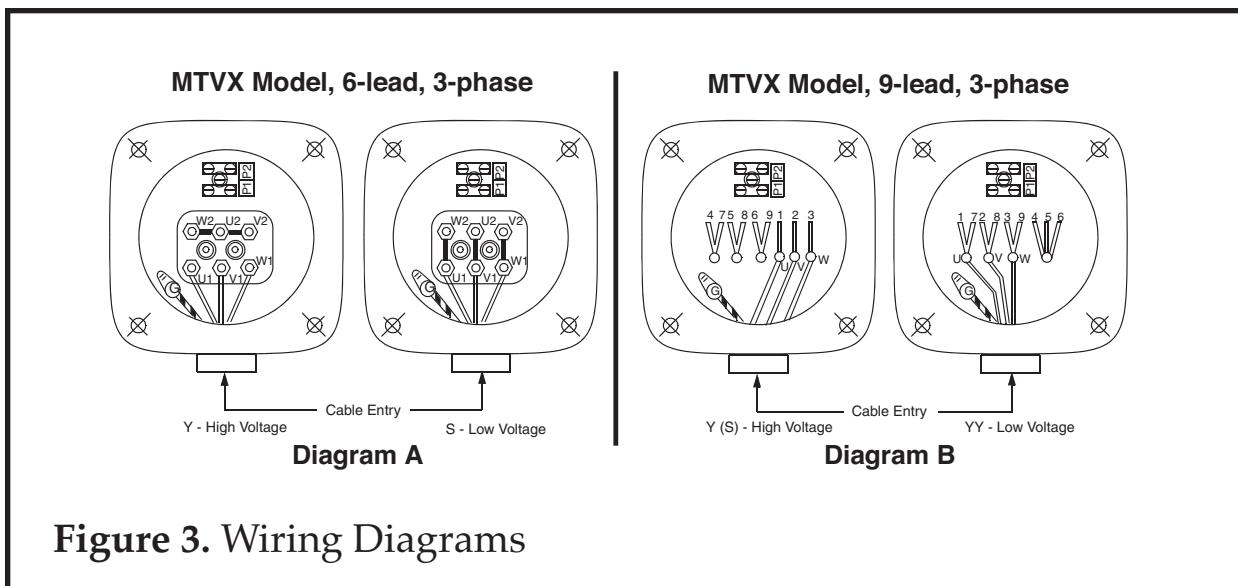


MVTX G/D - Stainless Name Plate

Figure 2. Nameplates

Wiring Electric Vibrator

It is mandatory to comply with the National Electrical Code, NFPA 70, and all applicable local codes. Remove the screws with washers securing the wiring box cover along with the foam rubber block and set aside. Identify the wiring diagram by referencing the wiring diagram found within the wiring box or by referring to the diagrams shown in Figure 3.



Select a 4-conductor cord for Class I only electric vibrators. Select a 6-conductor cord for Class I and Class II vibrators. The cord type shall have a voltage rating not less than the power supply voltage and a minimum temperature rating of 105°C. We recommend Coleman black cord SEOOW Seoprene cable rated 600 V and 105°C. Coleman Cable Inc. can be reached by phone at 847-672-2300 or at www.colemancable.com. Italvibras USA also stocks the Coleman cable.

When wiring the electric vibrator, leave enough slack in the cord so that the cord does not become taut during operation causing stress on the connections. It is always best to position the cord down so that should there be any moisture present the moisture would tend to run down instead of into the vibrator wiring box.

Trim the cord by removing the jacket exposing the conductors and ground wire for approx. 6 in. Be careful not to cut the conductor or ground wire insulation. Insert the cord through the conduit fittings and then through the opening in the side wall of the wiring compartment. Position the jacket of the cord approx. 1/2 in beyond the inside wall of the wiring box wall. Assemble all conduit fittings making sure that there is always minimum thread engagement of 5 full threads. Install the conduit seal following all instructions being certain to comply with Articles 501 and 502 of the NEC.

Wiring Electric Vibrator Cont.

Trim the conductors within the wiring box leaving plenty of slack. Next, strip the conductor insulation for $\frac{1}{4}$ in. to $\frac{3}{8}$ in. Crimp on closed loop wire connectors. Use only the intended crimping tool as designated by the wire connector manufacturer. The conductors should be neatly arranged on the floor of the wiring box. The wires should not cross over each other. See Figure 4.

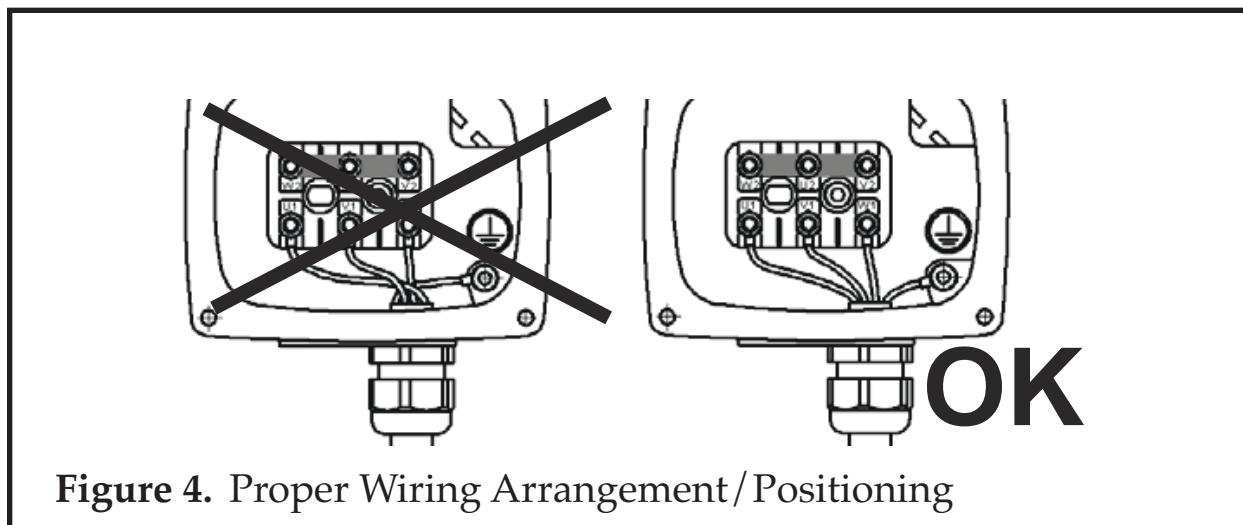


Figure 4. Proper Wiring Arrangement/Positioning

Secure the wire connectors and the shorting bars to the terminal block in the positions shown on the wiring diagram using the hardware provided. It is essential that the hardware be positioned as shown in Figure 5.

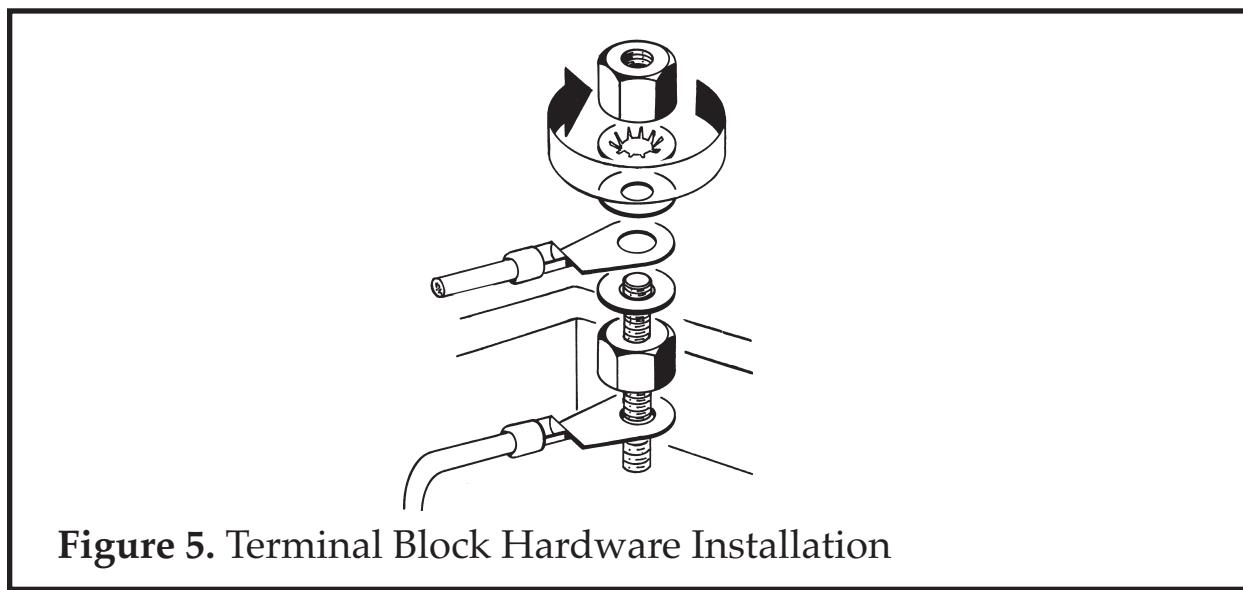


Figure 5. Terminal Block Hardware Installation

Wiring Electric Vibrator Cont.

Note that the closed loop wire connectors provided on the power supply cord are positioned between the two flat washers. A drop or two of thread sealant such as Locktite is recommended. Do not use permanent thread sealant because the terminal block will be damaged should you wish to remove and replace the power supply cord. The terminal block nuts should not be over tightened since the possibility of damaging the plastic insulating body is high. Reference table III in the Appendix for torque values. Make the connections hand-tight followed by a $\frac{1}{4}$ turn but never put a ratchet on these nuts.

For constructions that do not incorporate terminal blocks, make the wire-to-wire connections using wire nuts. The nuts should be taped with electrical insulation.

Electric vibrators for use in Class I and Class II hazardous locations will include a small 2-pole terminal block in the wiring box. This is the thermostat circuit. Proceed to Thermostat Wiring. Class I electric vibrators do not include this circuit. For Class I electric vibrators, reinstall the rubber block over the power supply conductors and install the wiring box cover being careful not to pinch the O-ring. Screw torque is specified in the Appendix. Reference Figure 6.

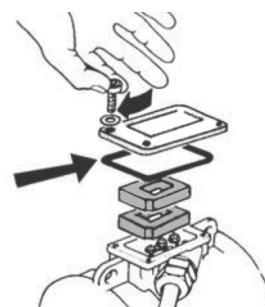


Figure 6. Wiring Block Assembly

Thermostat Wiring

Class I and Class II electric vibrators have thermostat circuits installed in the winding. The thermostat terminals are identified as P1 and P2. These devices are intended to limit surface temperatures to no more than the marked operating temperature (code). Connect the thermostats to the motor starter as shown in Figure 7. The thermostat circuit is rated 600 V ac maximum and 720 VA. Use a manual momentary start switch.

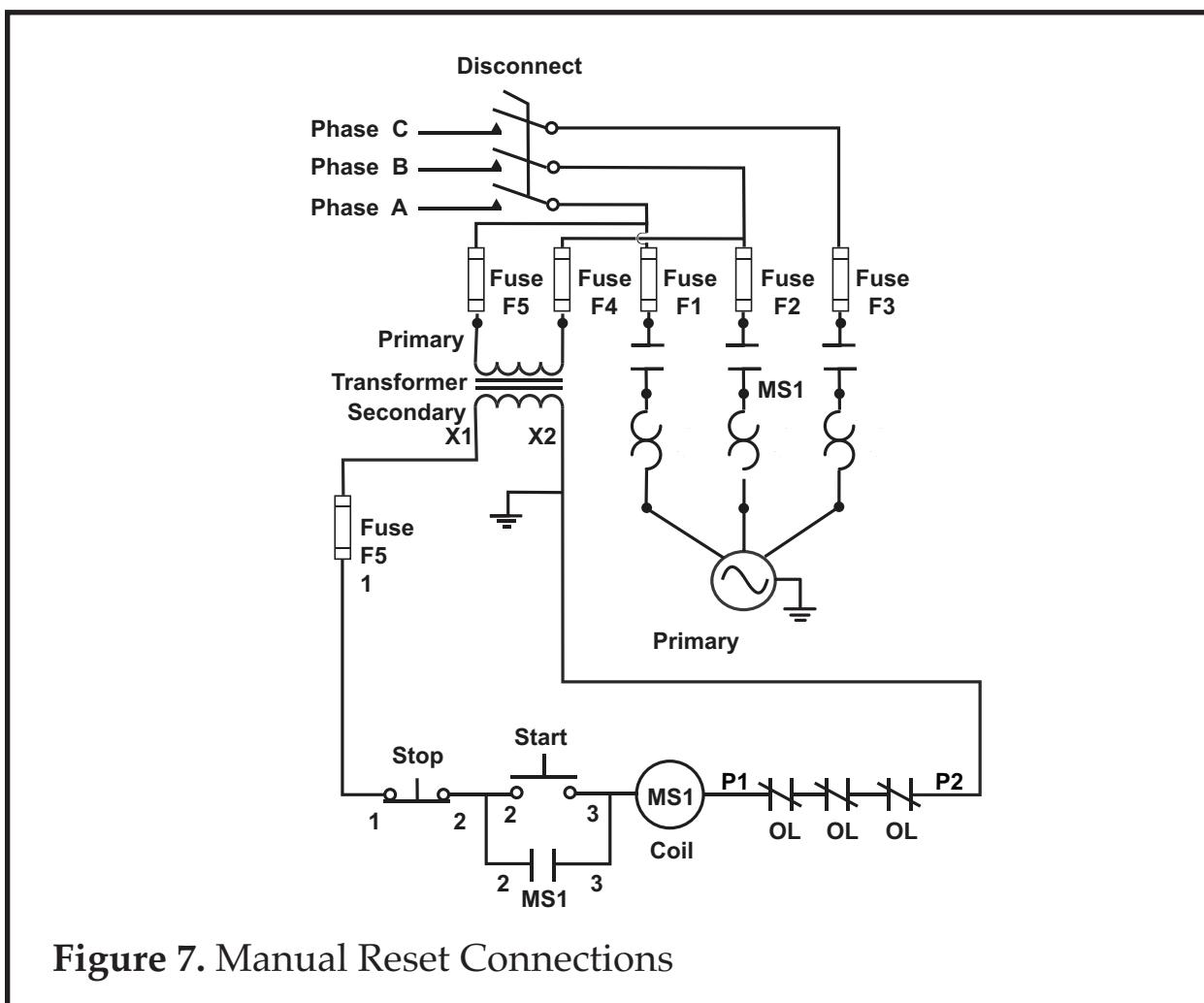
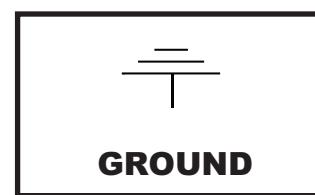


Figure 7. Manual Reset Connections

Reinstall the rubber block over the power supply and thermostat circuit conductors and install the wiring box cover being careful not to pinch the O-ring. Screw torque is specified in the Appendix. See Figure 6.

Grounding & Bonding

The electric vibrator must be grounded using the ground wire provided in the cord. The ground wire shall be connected to a closed loop wire connector which is then connected to the ground terminal located within the wiring box (See Figure 4). The ground terminal is identified by the international symbol.



It may be necessary to bond the electric vibrator to ground using the external ground screw as shown in Figure 8. The external ground terminal is identified by the international symbol. Use a wire size no smaller than the internal ground wire.

Grounding & Bonding Cont.

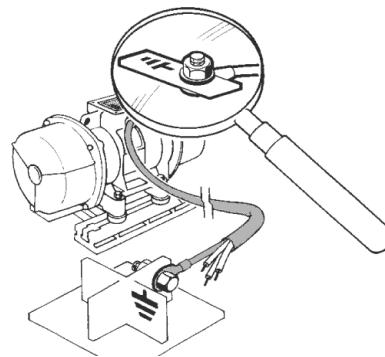


Figure 8. Ground Bonding Screw

Overload, Short-Circuit & Ground-Fault Protection

In the USA, The National Electrical Code, NFPA 70, and all applicable local codes, govern how to properly size, select and install overload protection (sometimes called heaters) and short-circuit and ground-fault protection (fuses or circuit breakers). Proper selection and installation of these devices is required and essential for not only protection of the electric vibrator and the power supply circuit but also for protection of personnel.

If the overload or short-circuit and ground fault protection operate, have qualified personnel locate and fix the problem before resetting.

When operating two electric vibrators, the vibrators should be controlled with a single motor starter that has overload protection dedicated to each electric vibrator. The overloads shall be electrically interlocked such that should there be a fault with one electric vibrator, both electric vibrators will be de-energized.

Variable Frequency Inverter

The electric vibrators may be supplied with a variable frequency inverter. Never operate the vibrators above the maximum frequency noted on the nameplate. If operating two vibrators, use one variable frequency inverter along with overload protection dedicated to each electric vibrator. The overloads shall be electrically interlocked such that should there be a fault with one electric vibrator, both electric vibrators will be de-energized.

The nameplate current should never be exceeded throughout the entire frequency range.

Eccentric Weight Adjustment

The eccentric weights may be adjusted to produce the desired centrifugal force output. It is always best to operate the electric vibrator at the lowest weight setting that produces the desired result. This will result in lower energy expense and extend the bearing life. To adjust the force output, lockout/tag out the electric vibrator. Remove each weight cover and set it and the screws, washers and O-rings aside. Reference Figure 9. The outer adjustable weight clamping screw may be loosened and then the adjustable weights may be rotated to the desired position. Reference Figure 10.

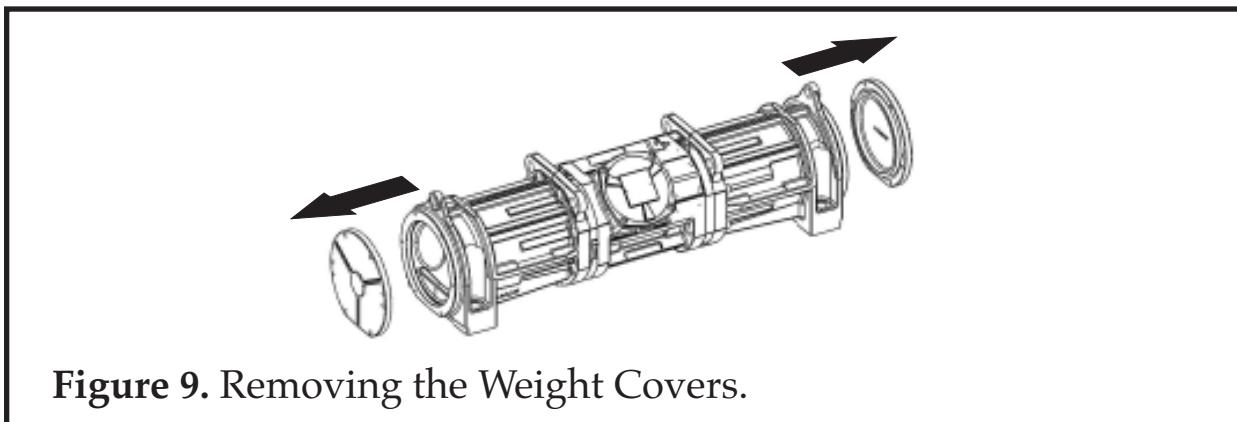


Figure 9. Removing the Weight Covers.

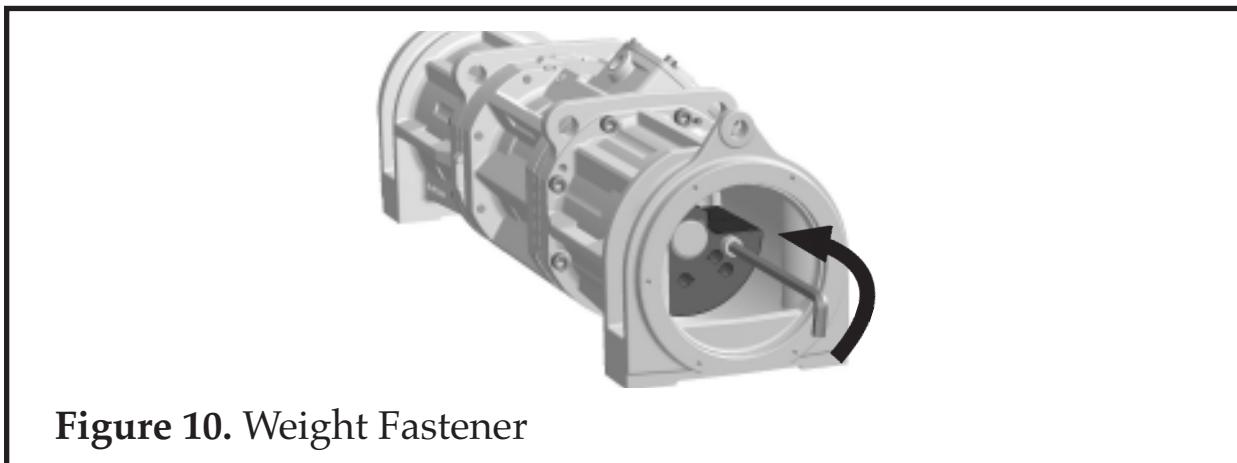


Figure 10. Weight Fastener

The eccentric weights must be adjusted to mirror images of each other at the same setting number as shown in Figure 11.

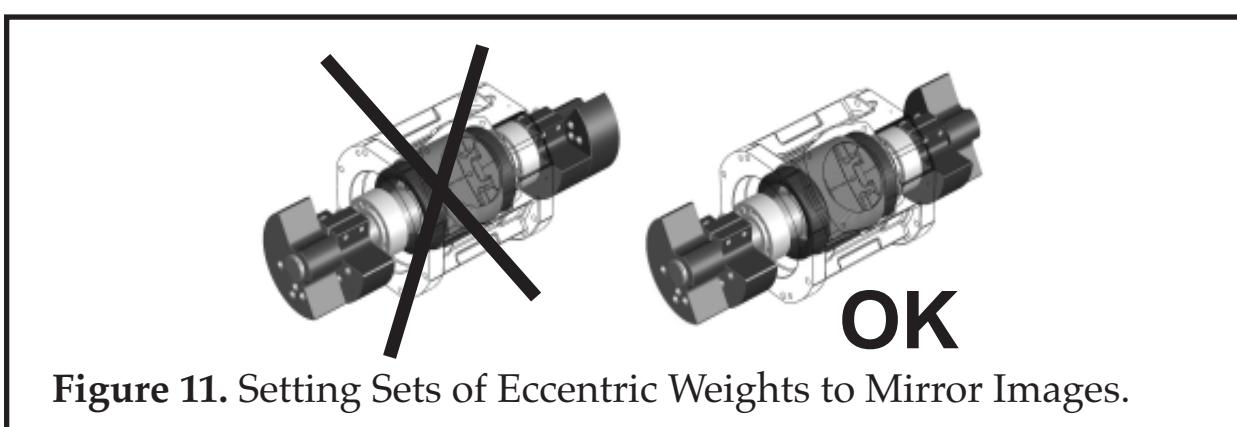


Figure 11. Setting Sets of Eccentric Weights to Mirror Images.

Eccentric Weight Adjustment Cont.

Properly torque the clamping screw to secure the weights in position. Torque values are outlined in the Appendix. Reference Figure 12. Reinstall the weight covers making sure not to pinch the O-rings.

Check shaft rotation before replacing weight covers. Start vibrator for 1 second, stop and lockout/tag out. Observe direction of rotation. If desired to reverse the direction of rotation, switch two of the three power supply leads in the wiring box or at the motor starter.

Replace weight covers using screws and washers being careful not to pinch the O-rings. The screw torque is outlined in the Appendix. Never operate the electric vibrator without weight covers in place. They provide a degree of protection for the bearings and a shield for the rotating eccentric weights. Always replace broken weight covers immediately. Do not operate electric vibrator with weight covers removed or with damaged weight covers.

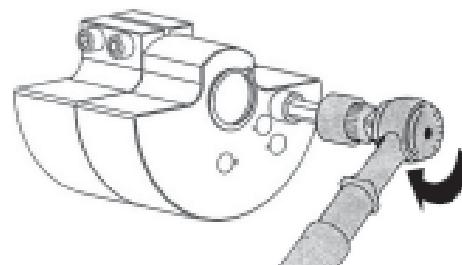


Figure 12. Eccentric Weight Adjust.

Starting Up

After making sure that the power supply voltage matches the voltage marked on the nameplate, that the mounting bolts are properly secured, that all covers are in place and secured, and that the motor starter is properly installed and adjusted, turn the electric vibrator on. Excessive noise would indicate a problem but slight bearing noise is normal due to the type of bearing used. After a few hours of operation, check each line current and verify that it does not exceed nameplate current. If the line current exceeds the nameplate current, then the mount needs to be stiffened, the vibrator weights need to be reduced or the vibrator needs to be moved to a more rigid location. Never operate the vibrator above nameplate current.

After the first 8 hours of operation, check the line current to make sure that it does not exceed nameplate and check mounting bolt torque. See MOUNTING HARDWARE AND TORQUE.

Electric Vibrator Lubrication

All electric vibrators are lubricated at the factory. If there are no external grease fittings, then the vibrator construction is lubricated for life. No grease ever need be added to these electric vibrators. If external grease fittings are provided, then it is intended that the bearings be periodically lubricated. The lubrication schedule is outlined in Table II.

Table II. Lubrication Schedule For Each Bearing

Frame Size	Grease Quantity, g	Lubrication Frequency, hrs.
70	26	2000
80	50	2000
90	70	2000

The lubrication frequency is every 2000 hours of operation unless specified otherwise in the table. There is an exception - 3600 rpm electric vibrators operating continuously or for long periods of time should be lubricated in $\frac{1}{2}$ the time specified using $\frac{1}{2}$ the grease volume specified. For all other vibrators, follow the table except when the operating temperature exceeds 90°C. If the operating temperature exceeds 90°C, reduce the lubrication frequency and lubrication volume by 50% for every 10°C increment above 90°C. If the electric vibrator operating temperature exceeds 100°C, contact Italvibras USA by phone at 815-872-1350. The electric vibrator should never operate above 120°C.

When adding grease through the grease fitting, make sure to clean the fitting so as not to introduce dirt into the bearing. Add the specified amount of grease. Experiment with your grease gun to determine how many grams are introduced with each pump. Never over-grease a bearing since this will damage the bearing and cause high operating temperature.

Always use the correct grease. Never mix greases. Use Kluber ISOFLEX TOPAS NB 52 grease. Kluber grease may be purchased direct from Kluber Lubrication by calling 800-447-2238. Italvibras USA also stocks the Kluber grease.

Electric Vibrator Repair

If the electric vibrator needs repair, contact Italvibras USA at 815-872-1350 for instructions. Most electric motor repair shops are not trained to repair our industrial electric vibrators. We recommend that they be returned to the service center located in Princeton, IL. Attempting to repair the electric vibrator or replace the bearings will void the warranty.

Electric Vibrator Maintenance

Every quarter, we recommend a thorough inspection of the electric vibrator. After lockout / tag out, do the following:

- 1.) Inspect the cord for any visible damage or wear. Replace the cord if there are any signs of damage or wear. This holds true for both the power supply cord and the thermostat circuit cord.
- 2.) Remove the wiring box cover and inspect for any foreign matter or liquid. Vacuum any foreign matter. If wet, remove electric vibrator from service and have the ground insulation tested by a trained, qualified and licensed technician.
- 3.) Before replacing the wiring box cover, make sure the electrical connections are tight (do not over-tighten) and inspect the cover O-ring and rubber compression block. If the O-ring or rubber compression block is damaged or if they have lost their compression set, replace them.
- 4.) Remove each weight cover and inspect for foreign matter. Vacuum if necessary. Replace O-rings if they are damaged or if they have lost their compression set.
- 5.) Check the mounting bolt torque.
- 6.) Replace any broken parts.

Appendix

Electric Vibrator Item Numbers

The table below outlines a list of electric vibrator Model/Type designations next to their respective Item No. The information is sorted by frame size. Please reference the Model/Type designation and Item No. when ordering electric vibrators or their parts.

Table III. Vibrator Item Numbers By Frame

Frame No.	Model	Item No.
70 Frame	MVTX 18-7700	601531
80 Frame	MVTX 18-10900	601534
90 Frame	MVTX 18-17000	601536

Electric Vibrator Torque Requirements

Table IV. Vibrator Nut & Screw Torque Requirements

Cap Screws	ft/lb (kgm)	Terminal Block Nuts	ft/lb (kgm)	Weight Screw	ft/lb (kgm)
M6	7 (1)	M4	0.87 (0.12)		
M8	16.5 (2.3)	M5	1.45 (0.20)		
M10	35 (4.8)	M6	2.17 (0.30)		
M12	58 (8)	M8	4.70 (0.65)		
M14	95 (13)	M10	9.80 (1.35)		
M16	137 (19)				
M18	195 (27)				
M20	275 (38)				
M24	470 (65)				

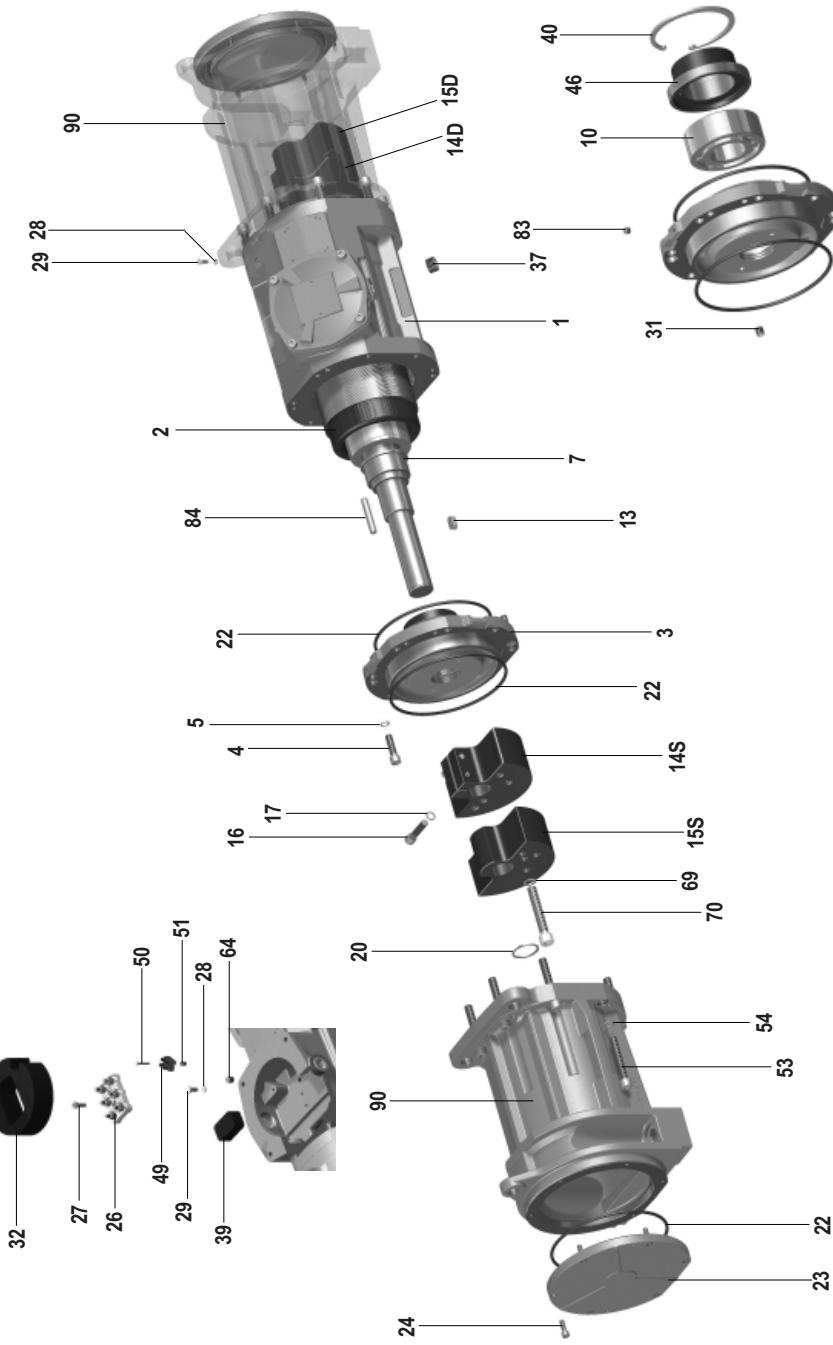
Item Numbers;**70 Frame**

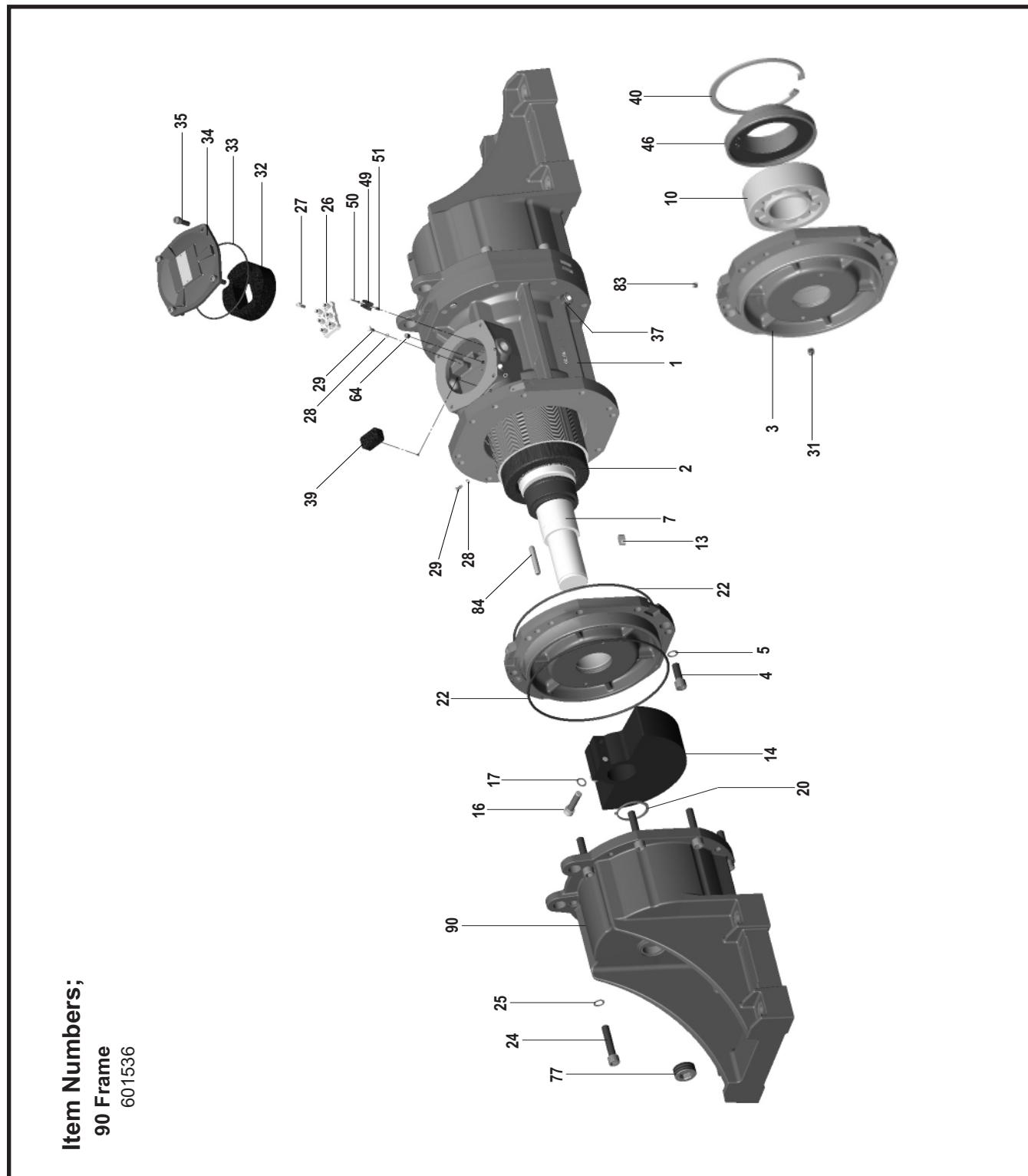
601531

80 Frame

601534

1 - CASE
 2 - STATOR
 3 - BEARING FLANGE
 4 - SCREW
 5 - SCHNORR WASHER
 7 - SHAFT
 10 - BEARING
 13 - SHAFT KEY
 14 - (S) LEFT FIXED WEIGHT
 14 - (D) RIGHT FIXED WEIGHT
 15 - (S) LEFT ADJUSTABLE WEIGHT
 15 - (D) RIGHT ADJUSTABLE WEIGHT
 16 - SCREW
 17 - SCHNORR WASHER
 20 - EXTERNAL SNAP RING
 22 - O-RING
 23 - WEIGHT COVER
 24 - SCREW
 25 - SCHNORR WASHER
 26 - TERMINAL BLOCK
 27 - SCREW
 28 - SCHNORR WASHER
 29 - GROUND SCREW
 31 - SET SCREW
 32 - RUBBER COMPRESSION BLOCK
 33 - O-RING
 34 - WIRING BOX COVER
 35 - SCREW
 37 - CONDUIT PLUG
 39 - LEAD PROTECTOR
 40 - INTERNAL SNAP RING
 46 - BEARING COVER
 47 - SCREW
 48 - SCHNORR WASHER
 49 - THERMISTOR TERMINAL BLOCK
 50 - SCREW
 51 - ADAPTER SCREW
 53 - SCREW
 54 - SCHNORR WASHER
 64 - SCREW
 69 - WASHER
 70 - SCREW
 77 - INSPECTION PLUG
 83 - SET SCREW
 84 - DOWEL PIN
 90 - END HOUSING





Part# -Description

1	-CASE
2	-STATOR
3	-BEARING FLANGE
4	-SCREW
5	-SCHNORR WASHER
7	-SHAFT
10	-BEARING
13	-SHAFT KEY
14	-(S) LEFT FIXED WEIGHT
14	-(D) RIGHT FIXED WEIGHT
15	-(S) LEFT ADJUSTABLE WEIGHT
15	-(D) RIGHT ADJUSTABLE WEIGHT
16	-SCREW
17	-SCHNORR WASHER
20	-EXTERNAL SNAP RING
22	-O-RING
23	-WEIGHT COVER
24	-SCREW
25	-SCHNORR WASHER
26	-TERMINAL BLOCK
27	-SCREW
28	-SCHNORR WASHER
29	-GROUND SCREW
31	-SET SCREW
32	-RUBBER COMPRESSION BLOCK
33	-O-RING
34	-WIRING BOX COVER
35	-SCREW
37	-CONDUIT PLUG
39	-LEAD PROTECTOR
40	-INTERNAL SNAP RING
46	-BEARING COVER
47	-SCREW
48	-SCHNORR WASHER
49	-THERMISTOR TERMINAL BLOCK
50	-SCREW
51	-ADAPTER SCREW
53	-SCREW
54	-SCHNORR WASHER
64	-SCREW
69	-WASHER
70	-SCREW
77	-INSPECTION PLUG
83	-SET SCREW
84	-DOWEL PIN
90	-END HOUSING

Order Information

When ordering, please specify the following:

Vibrator Model _____

Series _____

Serial number _____

Voltage, frequency & number of phases _____

Part#/Description	Quantity Required	Part#/Description	Quantity Required
1 CASE _____		31 SET SCREW _____	
2 STATOR _____		32 RUBBER COMPRESSION BLOCK _____	
3 BEARING FLANGE _____		33 O-RING _____	
4 SCREW _____		34 WIRING BOX COVER _____	
5 SCHNORR WASHER _____		35 SCREW _____	
7 SHAFT _____		37 CONDUIT PLUG _____	
10 BEARING _____		39 LEAD PROTECTOR _____	
13 SHAFT KEY _____		40 INTERNAL SNAP RING _____	
14 (S) LEFT FIXED WEIGHT _____		46 BEARING COVER _____	
14 (D) RIGHT FIXED WEIGHT _____		47 SCREW _____	
15 (S) LEFT ADJUSTABLE WEIGHT _____		48 SCHNORR WASHER _____	
15 (D) RIGHT ADJUSTABLE WEIGHT _____		49 THERMISTOR TERMINAL BLOCK _____	
16 SCREW _____		50 SCREW _____	
17 SCHNORR WASHER _____		51 ADAPTER SCREW _____	
20 EXTERNAL SNAP RING _____		53 SCREW _____	
22 O-RING _____		54 SCHNORR WASHER _____	
23 WEIGHT COVER _____		64 SCREW _____	
24 SCREW _____		69 WASHER _____	
25 SCHNORR WASHER _____		70 SCREW _____	
26 TERMINAL BLOCK _____		77 INSPECTION PLUG _____	
27 SCREW _____		83 SET SCREW _____	
28 SCHNORR WASHER _____		84 DOWEL PIN _____	
29 GROUND SCREW _____		90 END HOUSING _____	

Fax, Phone or E-Mail to:



Italvibras USA
 1940 Vans Way
 Princeton, IL 61356
 p. 815-872-1350
 f. 866-337-2693
 parts@italvibrasusa.com
 www.italvibrasusa.com